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| --- |
| Use the Van de Walle text and the TN Math Standards to complete this assignment. If other resources are used in addition, please cite with the URL or bibliographic information. |

*Chapter 16 Developing Fraction Operations*

1. What are the 3 reasons why teachers should commit to **teaching fraction operations with understanding**?

a.

b.

c.

1. Describe the four steps to **effective fraction computation** instruction.

|  |  |
| --- | --- |
| 1. Use Contextual Tasks |  |
| 2. Explore each operation with a variety of model |  |
| 3. Let estimation and invented methods play a big role in the development of strategies. |  |
| 4. Address common misconceptions regarding computational procedure. |  |

**Addition and Subtraction**

3. Solve the following problem in 2 different ways – describe and show your work. If you want to work on paper, please take a picture of your work and insert the image below.

*Jacob ordered 3 pizzas. But before his guests arrived he got hungry and ate 3/8 of one pizza. How much was left for the party?*

4. Watch the video, adding fractions with rectangle models.

<https://www.youtube.com/watch?v=WrvDWD9HvOs>

Stop the video at about 5 minutes in to solve the problem ¼ + 2/3 on paper. Insert a picture of your work. (*You can watch the rest of the video after you’ve attempted the problem to see how you do*.)

5. Models for Addition and Subtraction – complete the chart below.

|  |  |  |
| --- | --- | --- |
| **Model Type** | **Examples of Manipulatives** | **Important areas to consider with this type.** |
| Area |  |  |
| Linear |  |  |

6. Explore the *Conceptua Fractions* free web tools at <https://www.conceptuamath.com/app/tool-library> Select the “Add Fractions with Uncommon Denominators” or the “Subtract Fractions with Uncommon Denominators”. Watch the short video about how to use the tool. Try out at least one problem using area, set, and length models with the “Try this tool” option.

Take a screenshot with one of the tools showing your problem and insert as an image below:

*Which tool did you use?*

*What problem did you practice?*

*How can using tools like these help students?*

*Did they help you understand adding/subtracting with fractions? Why or why not? Which model do you prefer*?

7. Describe the two methods to estimate fraction sums and differences.

a. Benchmarks-

b. Relative size of unit fraction –

8. How does **iteration** apply to adding fractions with like denominators?

9. Select two of the following four **Misconceptions** with fraction operations. Describe what the common error or misconception is and how to address the error.

a. Adding both numerators and denominators –

b. Failing to find common denominators –

c. Difficulty finding common multiples –

d. Difficulty with Mixed numbers –

**Multiplying Fractions**

10. How does skip counting or iteration apply to multiplying a fraction by a whole number? Provide an example.

11. Fill in the blank: 3 x 4 means 3 \_\_\_\_\_\_\_\_\_ of 4

2/3 x 15 means 2/3 of a \_\_\_\_\_\_\_\_\_\_\_\_ of 15

12. Solve the following problem using the multiplication of fractions area model found at: <http://nlvm.usu.edu/en/nav/frames_asid_194_g_2_t_1.html?from=category_g_2_t_1.html>

*Little Red Riding Hood uses 4/5 of a cup of vinegar in her salad dressing recipe. How much vinegar would Little Red Riding Hood use to make 1/5 of the recipe?*

Take a screen shot (and insert below) of the solution and explain how the use of this model can help students understand the concept of multiplying fractions. What is the answer?

13. Explain how to deal with these 3 misconceptions of multiplying fractions:

a. “Treating the Denominator the Same as in addition/subtraction problems”:

b. “Inability to estimate approximate size of the answer”:

c. “Matching Multiplication Situations with Multiplication (and not Division)”:

**Fraction Division**

14. Division should follow a developmental progression that focuses on four types of problems. Fill in the table:

|  |  |
| --- | --- |
| **Type of Problem** | **A conceptual example or model that represents this type of problem.** |
| a. Whole Number divided by whole number | 5 sandwiches shared with 4 friends (5÷4). If you partition each sandwich into fourths, you see that each friend will have five-fourths. |
| b. |  |
| c. |  |
| d. |  |

15. What is the common denominator algorithm for dividing fractions?

16. Watch the following video that describes how to help students develop/discover the invert and multiply algorithm. <https://www.youtube.com/watch?v=0xY78wEnZNI>

What recommendations are made for this algorithm?

17. What is wrong with teaching multiplication makes bigger and division makes smaller (in the context of fractions)?

*Chapter 17 – Operations with Decimals p. 416-*

18. 5th grade is the first time that students are expected to complete operations with decimals. Locate Standard **5.NBT.B.7**. Copy and paste the standard below.

What do you notice should be the main techniques students should use for decimal operations in 5th grade?

19. Use the NLVM game “Circle 3” to see how well you can use reasoning to combine decimals to add to 3. Take a screenshot to show your success! (or take a screen shot as well if you keep trying and get stuck!).

<http://nlvm.usu.edu/en/nav/frames_asid_187_g_2_t_1.html?open=instructions>

20. Use Base Block Decimals to practice addition and subtraction of decimals. Practice several problems Click “Instructions” if you need help.

<http://nlvm.usu.edu/en/nav/frames_asid_264_g_1_t_1.html?from=topic_t_1.html>

Take a screenshot of one of the problems that you complete and insert below.

21. Use the Fraction Decimal Grid Virtual manipulative to practice using a model to practice multiplying decimals. <https://go.hrw.com/math/midma/gradecontent/manipulatives/Decimal_Fractions/Decimal_Fractions.html>

Change the drop down menu in top right corner to “multiply”. Use one grid with 10 rows to model multiplying 2 decimals. Take a screen shot of what you modeled. Insert below.

What is the equation that represents the problem that you modeled?

22. We need to teach dividing decimals at a concrete, pictorial level before we move to an abstract level. The two videos linked below show how to divide decimals at a concrete level with base-ten blocks.

<https://www.youtube.com/watch?v=WFXMkD5ICKI>

<https://www.youtube.com/watch?v=FoEBu3Ts1Ig&feature=related>

Please watch these two videos. Next - complete a Google Search to see if you can find any virtual manipulatives, short videos, or activities that show dividing or multiplying fractions using a concrete model. Pick your favorite one and provide the link below.

Provide a brief description of your resource.